Creating new jobs, products, and markets for coal

RARE EARTH ELEMENTS & CRITICAL MINERALS

PIONEERING TECHNOLOGIES FOR RECOVERY OF DOMESTIC RARE EARTH ELEMENTS (REES)

Development and testing of conventional and potentially transformational separation technologies at small-scale processing facilities for recovering REEs from coal and coal by-products in a cost-effective and environmentally benign manner.

These technologies are being developed to provide a domestic supply of rare earth oxides, reduce costs and increase efficiency for processing, and provide additional economic opportunities to coal mining communities.

IMPROVING COST & ADDING VALUE TO COAL PRODUCTION

The University of Kentucky (UK) is testing a 1/4 ton/hr (230 kg/hr) pilot-scale plant for the extraction of REEs from Central Appalachian and Illinois Basin bituminous coal preparation plant refuse materials.

West Virginia University (WVU) is operating a bench-scale facility using approximately 150–200 g/hr (0.33–0.44 lb/hr) of solid residues generated from acid mine drainage (AMD).

ACCOMPLISHMENTS & OPERATING FACILITIES

- Using continuous solvent extraction in the laboratory, UK produced a mixed rare earth product from coal refuse. This product contained a rare earth oxide concentrate of up to 98% (equivalent to 80% on an elemental basis)—the highest quality REE product generated to date by external participants.
- Initiated testing at pilot-scale facility.
- Produced 5% REE pre-concentrate at >90% REE recovery using AMD solids from the Northern and Central Appalachian Basins in laboratory experiments.
- Testing a continuously operating bench-scale unit that will yield 3 g/hr (0.007 lb/hr) of REE concentrate (purity ≥2% by weight).

QUICK FACTS

AWARD NUMBER
DE-FE0027035 (UK)
DE-FE0026927 (WVU)

PROJECT BUDGET
UK TOTAL AWARD VALUE $8,820,009
WVU TOTAL AWARD VALUE $4,339,414

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